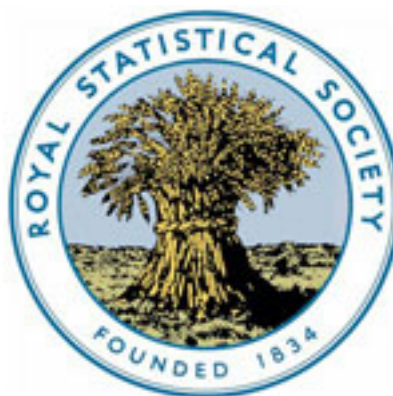


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Operations Research for Management. by J. F. McCloskey; F. N. Trefethen

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therefore goes on to give nineteen short surveys of important or typical areas among which certain islands afford the most striking examples of Malthusian dangers. It might have been preferable to have provided fuller accounts and more thorough analyses of a smaller number of countries, but although occasionally over-simplified the presentation is pithy and on the whole very effective.

In a section entitled "Nation and Family" the actions of Governments that place one or other of these ideals high in their population policies are contrasted. Among those policies which, perhaps, have regard more to the nation than to the family there are two designed—in their different ways—to promote births (those in France and Russia) and two designed to limit births (those in India and Japan). Sweden and the United Kingdom are cited as examples of countries where the family is the major object of concern. The formulation of population policies is a task to which many more governments will have to address themselves in the coming years, and in making this latest survey of tendencies the Group have therefore performed a useful function.

State intervention can, if made drastically enough or at the appropriate moment, have a great influence on population, even if it runs contrary to established belief and custom. Sometimes voluntary action can also be powerful. Having shown these facts to be true, the authors of the Report have gone on, in their concluding remarks, with some confidence to outline the steps that will be required to keep the Malthusian devil at bay in the coming decades. First of all, the great unawareness of population problems that still exists in the world must be abolished and supplanted by the spread of enlightenment. Secondly, research into the interrelationships between the growth of numbers and the growth of resources, and into the regulation of human fertility, must be vigorously pursued. Finally, surveys should be made of all areas where population is outstripping food and other supplies, and in these areas technical aid and other programmes of assistance should be adapted to the double task of promoting the development of resources while at the same time restraining population from making a corresponding or greater increase.

The conclusions and recommendations of the Group seem fairly to sum up and round off the book. While the forecasts upon which much of the argument rests may be fallible, and while the authors may not be entirely free from bias—both of these possibilities are freely admitted in the Report—it can at least be said that a valiant effort has been made to treat an awkward subject with the logic and impartiality that its great importance demands.

P. R. Cox.

11. *Operations Research for Management*. Edited by J. F. McCloskey and F. N. Trefethen. Baltimore: Johns Hopkins Press, 1954. London: Cumberlege. xxiv, 409 pp. 9". 60s.

The term "Operational Research" was coined before the second world war to distinguish those radar research scientists who found they could advise the armed services on the operational use of radar and its integration within the general scheme of the defence of this country. This does not mean that operational research as such had not been carried out earlier, but this was when it began to be recognized as a distinct entity. The war gave a great impetus to the development of operational research methods in the military sphere, and with the end of the war the recognition of the value of operational research spread to industry. These remarks apply to the United States as well as to this country, and in each there is a flourishing society devoted to collating operational research and to providing a forum of discussion for its practitioners. In the United States a number of universities, research institutes and institutes of technology have operational research groups doing advisory work for industry. Many of these institutions run regular training courses in the subject as part of their curriculum and it is now possible to obtain a doctorate in operational research at the Case and Massachusetts Institutes of Technology. In this country regular courses have been held at Birmingham University, but as yet academic institutions have not interested themselves in operational research on anything like the scale of the Americans.

Some years ago Morse and Kimball wrote their now celebrated book on operational research.* This covered mainly the military applications of the subject. What has been lacking until now has been a text-book of operational research from which the intelligent layman can see how far its techniques and applications warrant it being established as a distinct entity, to which the practitioner may turn for technical advice and information. Such a book now appears from Johns Hopkins University and is the subject of this review.

For some years Johns Hopkins have run a regular weekly seminar in operational research to which visiting lecturers have been invited to give papers. These papers have been published by the University as monographs and some have appeared in the *Journal of the Operations Research Society of America*. This new book brings together in one volume a number of these papers. The book inevitably gains advantages and suffers drawbacks. It is clearly an advantage to have

* Morse, P. M. & Kimball, G. E. (1951), *Methods of Operations Research*. New York: Technology Press of Mass. Inst. of Technology and John Wiley. London: Chapman & Hall.

the various sections of a pioneering book in a new field written by people who can speak with authority on the particular subjects they cover. The disadvantage is that inevitably the linking between successive chapters is not well established and the common theme of operational research methods is not defined with sufficient emphasis for the layman to grasp at first sight.

The book is divided into three main sections. The first is a general one with an extremely interesting account of the history of operational research from 1936 onwards. It is perhaps a pity that earlier historical examples of operational research are not given. Other chapters in this section cover operational research as a profession, and as a science, as well as its organization and relationship to management consulting.

The second main section is devoted to the methodology of the subject. This is covered by chapters on statistics, queueing theory, information theory, suboptimization, symbolic logic, computing machines, linear programming and game theory. These chapters are particularly well written and give concise accounts which can be used as introductions to the particular techniques.

The final section gives a number of case histories. One, a study of operational research in agriculture by C. W. Thornthwaite, is an admirable example of how a simple technical job, in this case to advise on supplemental irrigation, can become subsidiary to a much broader and more important problem. One omission in this and the preceding section is any discussion of communication problems.

The dividends accruing from a "mixed team" approach in operational research are by now well known but the danger of specialist scientists trying to cast an operational research problem in the image of their own specialization must be avoided. It is, therefore, necessary in a text-book of this sort to establish the primacy of the type of problem rather than the type of solution employed. In this book we have two distinct sections, one on technique and one on problems in different industries. The general theme of operational research might have been established more clearly had the second and third sections been reversed in order. The second section would then be devoted to problems of operational research, and these could well be better classified according to their general type than to the industry in which they occur. Such a classification by type is given in this book by Goodeve in his chapter on operational research as a science. He classifies problems in three main categories as follows:

I. *To do with people alone.*—(a) Organization and management. (b) Absenteeism and labor relations. (c) Economics. (d) Decisions of individuals. (e) Market research.

II. *To do with people and machines.*—(a) Efficiency and productivity. (b) Organization of flow in factories. (c) Methods of quality control, inspection and sampling. (d) Accidents. (e) Organization of technological change.

III. *To do with movement.*—(a) Transport. (b) Stocking, distribution and handling. (c) Communications.

The sections on techniques and methodology would then come as a final section which would give an introduction to the methods being used in present day operational research.

The authors are, however, to be congratulated in bringing together in one volume so much that is new and stimulating both to the operational research worker and the scientist in contiguous fields.

B. H. P. RIVETT.

12.—*The Redistribution of Income in Postwar Britain: A Study in the Effects of the Central Government Fiscal Program in 1948–49.* By Allan M. Cartter. Yale University Press (London, Geoffrey Cumberlege), 1955. xi, 242 pp. 9½". 40s.

This is a book of scope and objective which make it of direct interest to a wider audience than can usually be expected for a purely statistical study. The author has attempted to measure the redistribution of incomes in post-war Britain with particular reference to the effect of the legislative programme for the year 1948–49.

He has divided his study into two parts. The first is mainly concerned with the final results and includes an introductory chapter on the theoretical problems and a concise summary of the general conclusions. This Part is well designed for the general reader. Professor Cartter has set out the results of his statistical calculations in clear tables and text, has analysed these data to seek answers to a series of very pertinent questions and has interpreted the answers with a forthright conviction.

The second part is addressed to the technical reader and describes the assumptions, raw material and statistical methods underlying the tables in Part I. It is to be hoped that the general reader will take the trouble to read enough of Part II to realize how much personal ingenuity has been applied